

REMARKS

The claims are 1-3, 5, 8-16, 18, 21-27 and 30, with claims 1, 14 and 30 being independent. Claims 17, 19, 20, 28 and 29 have been cancelled. Claims 1 and 30 have been amended to include the features of cancelled claims 28 and 29. Claim 14 has been amended to include all the limitations of claim 1. Claim 15 has been amended to provide terminal punctuation. Claims 23 and 24 have been amended for clarification in the same manner as claims 10 and 11 in the Amendment filed on October 19, 2001 (paper 8). No new matter has been added. Reconsideration of the present claims is expressly requested.

Under M.P.E.P. § 821.04, Applicants again request rejoinder of Group II, claims 14-27, directed to a method for making an endless belt of Group I. Claims 14-27 have been amended to be commensurate in scope with the claims of Group I. Therefore, since the claims of Group I are believed to be allowable for the reasons outlined below, the claims of Group II should be rejoined.

Claims 1-13¹ and 30 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,525,446 (Sypula) in view of JP 4-255332 (Mitsubishi). This rejection is respectfully traversed.

Prior to addressing the merits of the rejection, Applicants would like to briefly point out some of the key features and advantages of the presently claimed

¹/The Examiner will note that claims 4 and 6 were cancelled in Applicants' October 19, 2001 Amendment (paper 8). Accordingly, the rejection of these claims is moot.

invention. The present invention is directed to an endless belt that is formed by blown-film extrusion. The external diameter of the belt is greater than 100%, but does not exceed 400% of the external diameter of the die slit. As a result of such an extrusion, a resin film having a diameter that is larger than that of the die slit and a very small thickness, which is not larger than 1/3 of the slit width, is easily formed.

However, a resin film of these proportions also tends to be of uneven thickness, increasing the strain on and reducing the durability of the belt. Thus, Applicants have discovered that using an extrusion material that has a breaking extension of at least 2% and a tensile breaking strength of at least 40 MPa overcomes these problems (Specification, page 18, line 16 - page 19, line 7).

Sypula is directed to a method of producing an endless belt using a circular die. This reference teaches that the usable resins include a polysulfone and a polyethersulfone. However, Sypula is silent regarding the presently claimed breaking extension or tensile breaking strength of the extrusion material. The Examiner will note that the physical properties of the extrusion material do not depend only on the kind and molecular weight of the resin. These physical properties also depend on the nature, amount and dispersion state of the conductive particles used. Thus, it is clear that the presently claimed physical characteristics of the extrusion material are neither inherent nor optimizable features.

As is stated in the specification, if the extrusion material has a breaking extension of less than 2%, premature instantaneous solidification may occur. Further if the

material has a tensile breaking strength below 40MPa, the extruded product may have no body and it would not be able to maintain a cylindrical shape at the time of scale up inflation, resulting in wrinkles, strain and unevenness (see specification, page 18, line 16 - page 19, line 7; see also Comparative Example 1).

In addition, Applicants would like to reiterate that while Sypula does list a diphenyl sulfone as a possible resin. Further, it does not teach or suggest that this resin is specifically suitable for the melt-extruded belt sized as in the present invention or provide one iota of disclosure regarding this type of compounds being superior to others in a long list of compounds that it provides (Col. 2, line 57 - Col. 3, line 15; Col. 5, lines 35-57). In fact, at col. 5, line 44, Sypula mentions that polyethylene may be used as a suitable thermoplastic resin. Comparative Example 1 in the subject application clearly shows that this material, which also has a tensile breaking strength outside the presently claimed range, results in a belt that has insufficient strength and durability.

In sum, Sypula, considered as a whole, does not recognize the importance of a specific resin or its physical properties, as presently claimed, to form a melt extruded belt sized as in the present invention. Accordingly, Sypula cannot affect the patentability of the present invention.

Mitsubishi cannot cure the deficiencies of Sypula. While it discloses that a circular die is used to produce an endless belt using an extrusion method, like Sypula it does not disclose, teach or suggest an extrusion material that has a breaking extension of at least 2%, a tensile breaking strength of at least 40 MPa, an external diameter that is greater

than 100% but does not exceed 400% of the external diameter of the die slit, and thickness that is not greater than 1/3 of the slit width. In fact, Mitsubishi is understood to disclose a belt that has an external diameter smaller than the width of the die slit.

Also, while this reference discloses polysulfone and polyethersulfone as examples of usable resins, these resins are genres comprising thousands of possible compounds of which diphenyl sulfones are only a minute fraction. Applicants do not understand Mitsubishi to specifically disclose diphenyl sulfones or to teach or suggest that these compounds are suitable for the present invention. Mitsubishi is not understood to teach or suggest that an overwhelming majority of compounds it discloses would not result in a strong and durable endless belt sized as in the present invention or that even suitable materials must have specific physical characteristics. Accordingly, the disclosure in Mitsubishi is legally insufficient to affect the patentability of the present invention.

In conclusion, Sypula and Mitsubishi, whether considered separately or in combination, fail to disclose or suggest the present invention. Accordingly, these references cannot render the present invention unpatentable.

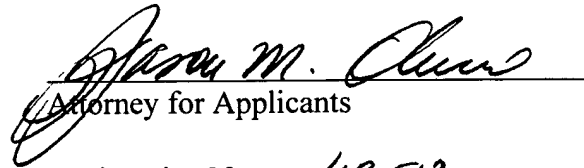
This Amendment After Final Rejection should be entered because it places the case in allowable form. Alternatively, it places the case in better form for appeal.

In view of the foregoing amendments and remarks, Applicants respectfully request that all rejections be withdrawn and the present case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our

address given below.

Respectfully submitted,


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APPENDIX

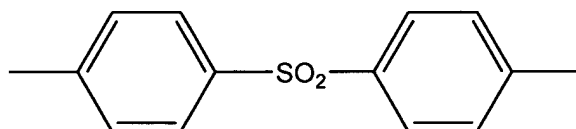
Application No. 09/09/467,986
Attorney Docket No. 03500.014120

IN THE CLAIMS:

Claims 17, 19, 20, 28 and 29 have been cancelled.

Claims 1, 14, 15, 23, 24 and 30 have been amended as follows:

1. (Twice Amended) An endless belt for electrophotography which is obtainable continuously by melt extrusion from a circular die; the endless belt comprising a layer containing a thermoplastic resin having a diphenyl sulfone structure represented by the following Formula (1)

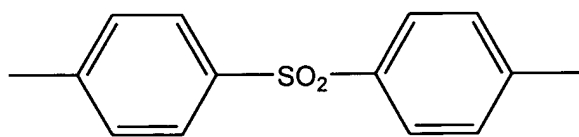


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the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die used and having an external diameter of more than 100% but less than or equal to 400% of the external diameter of the die slit of the circular die used, wherein an extrusion material has a breaking extension of 2% or more and a tensile breaking strength of 40 MPa or more.

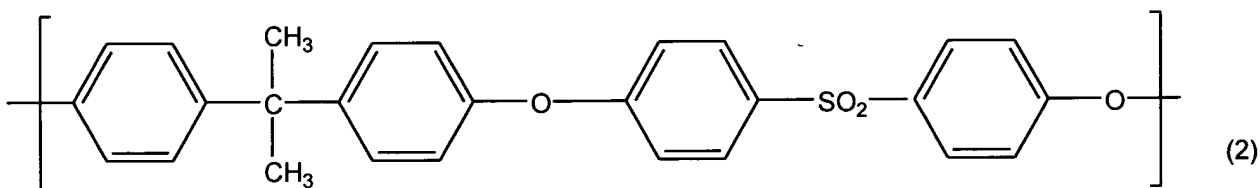
14. (Amended) A process for producing an endless belt for electrophotography; the process comprising the step of melt-extruding a thermoplastic resin having a diphenyl sulfone structure represented by the following Formula (1), from a circular die to produce the endless belt continuously



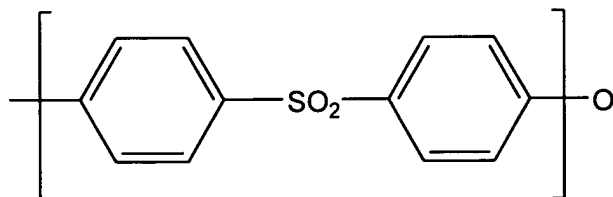
(1)

the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die used and having an external diameter of more than 100% but less than or equal to 400% of the external diameter of the die slit of the circular die used, wherein an extrusion material has a breaking extension of 2% or more and a tensile breaking strength of 40 MPa or more.

15. (Amended) A process according to claim 14, wherein said thermoplastic resin having a diphenyl sulfone structure is a thermoplastic resin having a structural unit represented by the following Formula (2) or (3)



(2)



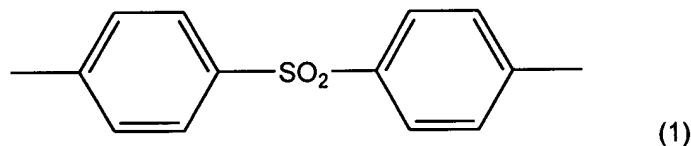
(3)

23. (Amended) A process according to claim 14, wherein said endless belt has a maximum value of a surface-direction resistance that [whose maximum value] is not greater than [within] 100 times a [the] minimum value of said surface-direction

resistance [thereof].

24. (Amended) A process according to claim 14, wherein said endless belt has a maximum value of a thickness-direction resistance that [whose maximum value] is [within] not greater than 100 times a [the] minimum value of said thickness-direction resistance [thereof].

30. (Twice Amended) An image forming apparatus for electrophotography comprising:[]
an endless belt which is obtainable continuously by melt extrusion from a circular die;
said endless belt comprising a layer containing a thermoplastic resin having a diphenyl sulfone structure represented by the following Formula (1)



the endless belt having a thickness not larger than 1/3 of the slit-width of the circular die used and having an external diameter of more than 100% but less than or equal to 400% of the external diameter of the die slit of the circular die used, wherein an extrusion material has a breaking extension of 2% or more and a tensile breaking strength of 40 MPa or more.